
**The Anomura (Crustacea, Decapoda) Species Found
in the Coasts of Gökçeada-İmbroz Island
(Aegean Sea)**

**Gökçeada-İmbroz (Ege Denizi) Kıyılarında Bulunan
Anomura(Crustacea, Decapoda) Türleri**

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Abstract

In this study, the bottom material were collected by using dredge, drift net and scoop net from 21 stations at the depths of 0-70 m in the Gökçeada Island between the years of 1997-1998. Ecological properties and synonyms of the 14 Anomura species belonging to 4 families were determined.

Key words: Anomura species, Gökçeada (İmbroz) Island, Aegean Sea.

Introduction

Gökçeada is situated in the north-eastern section of the Aegean Sea which was formed by the cracking and collapse of the earth's crust at the end of the III. Geological Era, that is nearly 2-2.5 million years ago. This island is, in fact, an extension of Anatolia and Thracia.

Gökçeada is approximately 7 knot far from the Gallipoli Peninsula, 6.5 knot from Lemnos Island in the west and 7.5 knot from Samothrace Island and it is the largest island of Turkey with an area of 285.5 km². Gökçeada is situated between 25°39'57" E - 26°01'00" E longitudes and 40°05'45" N - 40°14'45" N latitudes.

In the Aegean Sea there are 3 different masses of water, namely surface water, intermediate layer and deep water. The northern surface waters in the Aegean Sea where Gökçeada is located are under the effect of the Black Sea waters which display the characteristics of brackish water (Yüce, 1995).

There is not found any scientific investigation on the Anomura species of the North-East (NE) part of the Aegean Sea including Gökçeada Island in the Turkish territorial waters. Studies regarding Aegean Sea are exemplified with only Geldiay & Kocataş (1970), Kocataş (1981) and Katağan et al. (1988).

Anomura species living in the Greece territorial water of the Aegean Sea were listed by Koukouras et al. (1992). The purpose of this study is to determine the Anomura species living in the coasts of Gökçeada Island and to investigate some of their ecological properties.

Materials and Methods

Materials examined in this study were collected between the years of 1997-1998, from the depths of 0-70 m by using dredge, drift net and scoop net from 21 stations (Fig. 1). These materials preserved in 4 % formaldehyde prepared in sea water. Data about stations were shown in Table 1.

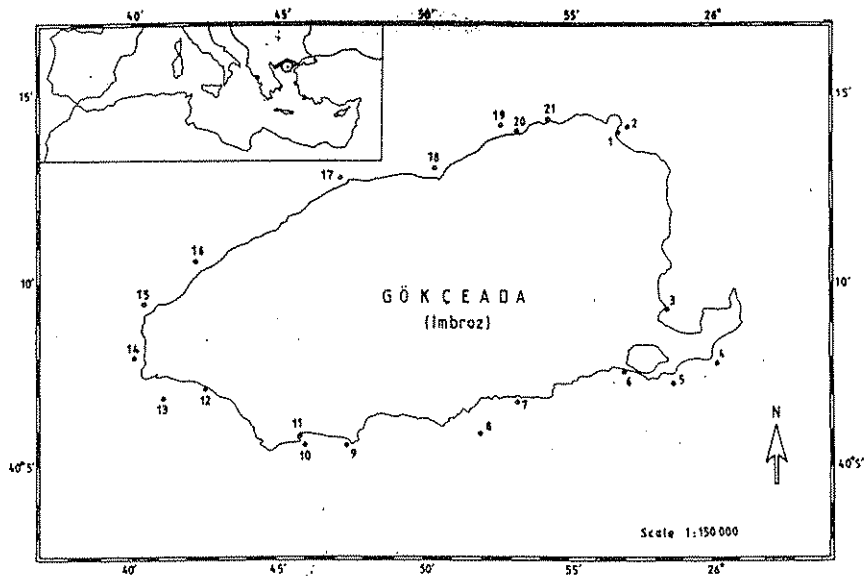


Figure 1. Sampling stations

As the ecological parameters, the temperature was measured by reversing thermometer on the Nansen bottle, salinity by Mohr-Knudsen method (Ivanoff, 1972) and the dissolved oxygen by Winkler method (Winkler, 1888).

Their systematic identifications were carried out with the help of Bouvier (1940), Zariquiey Alvarez (1968), Demir (1952), Holthuis (1950) and Ingle (1993).

Results

In our results, 14 Anomura species belonging to 4 families were determined. Their synonyms, maximum and minimum values of the ecological parameter on the sampling time, bottom structure and the numbers of the sampling stations were given as follows:

Order :Decapoda Latreille, 1803

Suborder: Anomura H. Milne - Edwards, 1837

Family: Diogenidae Ortmann, 1892

Genus: Paguristes Dana , 1851

Paguristes eremita (Linnaeus, 1767)

Paguristes eremita, Lewinsohn and Holthuis, 1986: 26; Stevcic, 1990: 220; Ingle, 1993: 39, figs. 1 - 4; Sakai, 1999: 12, Pl. 3, fig. F.

Paguristes oculatus, Pesta, 1918: 209, fig. 64; Bouvier, 1922: 14; Bouvier, 1940: 119, figs. 77, 78; Zariquiey Alvarez, 1946: 111, fig. 142; Holthuis and Gottlieb, 1958: 67; Zariquiey Alvarez, 1968 : 238, figs. 14a, 15c, 90j, 91b, d; Geldiay and Kocataş, 1970: 9, pl. I, fig. 2.

Paguristes maculatus, Heller, 1863: 172, pl. V, fig. 15; Carus, 1885: 494.

Ecological properties:0.5-35 m, 22.0-25.4 °C, 27.2-34.2 ‰, 2.9-6.9 mg/L; mud, sand and rock bottom.

Found in stations: 2, 8, 11, 19.

Genus: Diogenes Dana, 1851

Diogenes pugilator (Roux, 1829)

Diogenes pugilator, Pesta, 1918: 218, fig. 67; Bouvier, 1940: 123, fig. 81; Zariquiey Alvarez, 1946: 113, fig. 145; Holthuis, 1950: 130, figs. 47, 48; Demir, 1952: 387; Holthuis and Gottlieb, 1958: 68; Zariquiey Alvarez, 1968: 235, figs. 90i, 91a, k; Geldiay and Kocataş, 1970: 7, fig. 1, pl.I, fig. 1; Lewinsohn and Holthuis, 1986: 25; Stevcic, 1990: 219; Ingle, 1993: 46, figs. 9 - 12; Hayward and Ryland, 1996: 436, fig. 8. 53.

Diogenes varians, Heller, 1863: 170, pl. V, figs. 13, 14; Carus, 1885: 493.

Ecological properties: 0.5-30 m, 19.2-26.0 C, 27.0-36.9 ‰, 2.8-6.9 mg/L; sand and rock bottom.

Found in stations: 1,4, 5, 6, 7, 9, 10, 14, 15, 17, 18, 19.

Genus: *Clibanarius* Dana, 1852

Clibanarius erythropus (Latreille, 1818)

Clibanarius erythropus, Holthuis and Gottlieb, 1958: 67; Zariquiey Alvarez, 1968: 239, figs. 12f, 89a, 90l, 91c, i, l, m; Geldiay & Kocataş, 1970: 10, fig. 2, pl. I, fig. 3; Lewinsohn and Holthuis, 1986: 27; Stevcic, 1990: 220; Ingle, 1993: 58, figs. 21-24; Hayward and Ryland, 1996: 436 fig. 8. 53.

Clibanarius misanthropus, Heller, 1863: 177, pl. 5, figs. 16-18; Carus, 1885: 495; Milne — Edwards and Bouvier, 1894: 77; Pesta, 1918: 222, fig. 68; Bouvier, 1922: 15; Bouvier, 1940: 120, fig. 79; Zariquiey Alvarez, 1946: 112, fig. 143; Demir, 1952: 385, fig. 163.

Ecological properties: 0.5 m, 24.0-26.0 C, 27.0-29.9 ‰, 2.8-8.4 mg/L; rock bottom.

Found in stations: 1, 3, 12, 20, 21.

Family: Paguridae Latreille, 1803

Genus: *Anapagurus* Henderson, 1888

Anapagurus bicorniger A. Milne Edwards and Bouvier, 1892

Anapagurus bicorniger, Bouvier, 1940: 152, figs. 106, 107E; Zariquiey Alvarez, 1946: 123; Holthuis and Gottlieb, 1958: 73; Zariquiey Alvarez, 1968: 259; Geldiay & Kocataş, 1970: 21, fig. 9, pl. II, fig. 5; Stevcic, 1990: 221; Ingle, 1993: 67, figs. 30-33.

Ecological properties: 30 m, 19.2 °C, 36.9 ‰, 4.2 mg/L; sand bottom.

Found in station: 14.

Anapagurus laevis (Bell, 1845)

Anapagurus laevis, Milne- Edwards and Bouvier, 1894: 72, pl. XI, figs. 16- 28; Pesta, 1918:245, fig.75; Bouvier, 1922: 31; Bouvier, 1940: 145, figs. 100, 107A; Zariquiey Alvarez, 1946: 122, fig.157; Holthuis, 1950:

139, fig.50; Holthuis and Gottlieb, 1958: 72; Zariquiey Alvarez, 1968: 256, figs. 90r, 91j; Lewinsohn and Holthuis, 1986: 32; Stevcic, 1990: 222; Ingle, 1993: 77, figs. IIIA, 42-45; Hayward and Ryland, 1996: 436, fig. 8.53.

Ecological properties: 13-70 m, 16.5-23.0 °C, 34.4-38.0 ‰, 5.6-6.8 mg/L; sand and mud bottom.

Found in stations: 13, 18.

Genus: *Cestopagurus* Bouvier, 1897

Cestopagurus timidus (Roux, 1830)

Cestopagurus timidus, Lewinsohn and Holthuis, 1986: 31; Stevcic, 1990: 222; Ingle, 1993: 125, figs. III B, 97-100.

Catapaguroides timidus, Pesta, 1918: 248, fig. 76; Bouvier, 1940: 143, pl. IV, figs. 12, 13; Zariquiey Alvarez, 1946: 122; Holthuis and Gottlieb, 1958: 71; Zariquiey Alvarez, 1968: 254; Geldiay & Kocataş, 1970: 20, fig. 8, pl. II, fig. 4; Hayward & Ryland, 1996: 436, fig. 8. 53.

Eupagurus timidus, Heller, 1863: 165, pl. V, fig. 11; Carus, 1885: 492.

Ecological properties: 0.5 m, 26.0 °C, 27.0 ‰, 2.8 mg/L; rock bottom.

Found in station: 1.

Genus : *Pagurus* Fabricius, 1775

Pagurus anachoretus Risso, 1826

Pagurus anachoretus, Holthuis and Gottlieb, 1958: 71; Zariquiey Alvarez, 1968: 249, figs. 12e, 89i, 90g, k, 91 g; Geldiay and Kocataş, 1970: 18, fig. 7, pl. II, fig. 3; Lewinsohn and Holthuis, 1986: 30; Stevcic, 1990: 223; Ingle, 1993: 152, figs. 125-128.

Eupagurus anachoretus, Heller, 1863: 167, pl. V, fig. 12; Carus, 1885: 492; Pesta, 1918: 229, fig. 69; Bouvier, 1940: 138, fig. 94; Zariquiey Alvarez, 1946: 120, fig. 148, pl. VI, fig. c.

Ecological properties: 15-25 m, 21.0-22.8 °C, 34.1-34.2 ‰, 4.9-6.9 mg/L;

sand bottom.

Found in stations: 16, 19.

Pagurus cuanensis Bell, 1845

Pagurus cuanensis, Zariquiey Alvarez, 1968: 247, figs. 89d, 90a, n, 91h; Geldiay and Kocataş, 1970: 14, fig. 5, pl. I, fig.4; Lewinsohn and Holthuis, 1986: 29; Stevcic, 1990: 223; Ingle, 1993: 129, figs. 101-104; Hayward and Ryland, 1996: 438, fig. 8. 54.

Eupagurus cuanensis, Pesta, 1918: 232, fig.70; Bouvier, 1922: 32; Bouvier, 1940: 132, fig.88; Zariquiey Alvarez, 1946: 120, fig. 154.

Eupagurus lucasi, Heller, 1863: 163, pl. V, fig. 10; Carus, 1885: 492.

Ecological properties: 3-15 m, 22.0-22.8 °C, 33.4-34.2 ‰, 4.9-6.9 mg/L; sand bottom.

Found in stations: 10, 19.

Pagurus excavatus (Herbest, 1791)

Pagurus excavatus, Lewinsohn and Holthuis, 1986: 30; Stevcic, 1990: 224; Ingle, 1993: 141, figs. 113-116.

Pagurus alatus, Holthuis and Gottlieb, 1958: 71; Zariquiey Alvarez, 1968: 247, figs. 89e, 90b, o, 91e.

Eupagurus excavatus, Carus, 1885: 492; Pesta, 1918: 234, fig. 71; Bouvier, 1922: 32; Bouvier, 1940: 133, figs. 89, 90; Zariquiey Alvarez, 1946: 120, fig.150.

Eupagurus meticulosus, Heller, 1863: 167.

Eupagurus angulatus, Heller, 1893: 166; Milne – Edwards and Bouvier, 1894: 76.

Ecological properties: 30 m, 19.4 °C, 36.8 ‰, 4.2 mg/L; sand bottom.

Found in station: 15.

Pagurus prideaux Leach, 1815

Pagurus prideaux, Lewinsohn and Holthuis, 1986: 31; Stevcic, 1990: 224; Ingle, 1993: 148, figs. 121-124.

Pagurus prideauxi, Holthuis and Gottlieb, 1958: 71; Zariquiey Alvarez, 1968: 250, figs. 89h, 90e, p, 91f, n; Geldiay and Kocataş, 1970: 19, pl. II, fig. 2; Hayward and Ryland, 1996: 438, fig. 8.54.

Eupagurus prideauxi, Milne-Edwards and Bouvier, 1894: 73; Pesta, 1918: 239, fig.73; Bouvier, 1922: 35; Bouvier, 1940: 137, fig. 93; Zariquiey Alvarez, 1946: 121, fig. 155, pl. VI, fig. b.

Eupagurus prideauxii, Heller, 1863: 161, pl. V, figs. 1-8; Carus, 1885: 491.

Ecological properties: 15 m, 22.8 °C, 34.2 ‰, 6.9 mg/L; sand bottom.

Found in station: 19.

Family: Galatheidae Samouelle, 1819

Genus: Galathea Fabricius, 1793

Galathea squamifera Leach, 1814

Galathea squamifera, Heller, 1863: 190, pl. VI, fig.4; Carus, 1885: 488; Pesta, 1918: 254, fig. 77; Bouvier, 1922: 41; Bouvier, 1940: 168, fig. 128; Zariquiey Alvarez, 1946: 129, fig. 160, pl. VII, fig. a; Holthuis, 1950: 118, figs. 41, 42; Demir, 1952: 407, pl. 7, fig. 8; Holthuis & Gottlieb, 1958: 73; Zariquiey Alvarez, 1968: 274, figs. 97c, d, 98a, b; Geldiay and Kocataş, 1970: 22, pl. III, fig. 1; Lewinsohn and Holthuis, 1986: 33; Stevcic, 1990: 227; Hayward and Ryland, 1996: 440, fig. 8. 55.

Ecological properties: 25 m, 21.0 °C, 34.1 ‰, 4.9 mg/L; sand bottom.

Found in station: 16.

Family: Porcellanidae Haworth, 1825

Genus: Porcellana Lamarck, 1801

Porcellana platycheles (Pennant, 1777)

Porcellana platycheles, Heller, 1863: 185, pl.V, figs. 19-21; Carus, 1885: 496; Pesta, 1918: 270, fig. 84; Bouvier, 1940: 178, fig. 121, pl. V, fig. 7; Zariquiey Alvarez, 1946: 132, pl.VI, fig. e; Holthuis, 1950: 128, fig. 46; Demir, 1952: 413, pl. 8, fig. 2; Holthuis and Gottlieb, 1958: 77; Zariquiey Alvarez, 1968: 290, fig. 94c; Geldiay and Kocataş, 1970: 26, pl. III, fig. 5; Stevcic, 1990: 230; Hayward and Ryland, 1996: 442, fig. 8. 56.

Ecological properties: 0.5 m, 26.0 °C, 27.0 ‰, 2.8 mg/L; rock bottom.

Found in station: 1.

Genus : Pisidia Leach, 1820

Pisidia bluteli (Risso , 1816)

Pisidia bluteli, Zariquiey Alvarez, 1968: 291, figs. 94e, 103a, e, f; Geldiay and Kocataş, 1970: 28, fig. 12, pl.III, fig. 7; Stevcic, 1990: 229.

Porcellana Blutelii, Carus, 1885: 497.

Ecological properties: 0.5 m, 26.0 °C, 27.0 ‰, 2.8 mg/L; rock bottom.

Found in station: 1.

Pisidia longimana (Risso, 1816)

Pisidia longimana, Zariquiey Alvarez, 1968: 292, fig. 103b; Geldiay & Kocataş, 1970: 27, fig. 11, pl.III, fig. 6; Stevcic, 1990: 230.

Ecological properties: 15 m, 22.8 °C, 34.2 ‰, 6.9 mg/L; sand bottom.

Found in station: 19.

Discussion

Before the present study, Geldiay and Kocataş (1970) found 18 Anomura species from the Turkish territorial waters of the Aegean Sea. Kocataş (1981) reported 23 Anomura species from the same region in his check list. Katagan et al. (1988) contributed to species diversity of this region with the finding of 2 new species (*Munida intermedia*, *Munida iris rutilanti*). Koukouras et al. (1992) also reported 35 Anomura species from the Greek territorial waters of the Aegean Sea.

As a result, 14 of the Anomura species which are known to live in the Aegean Sea were determined in the coasts of Gökçeada Island.

Table 1. Data about stations

DN: Drift net DR: Dredge SN: Scoop Net

Station number	Date	Tool	Depth m	Temperature °C	Salinity‰	Dissolved oxygen mg/L	Bottom structure
1	26.07.97	SN	0.5	26.0	27.0	2.8	Rock
2	19.09.98	DR	10	22.0	33.4	2.9	Mud
3	09.06.98	SN	0.5	25.0	27.1	5.0	Rock
4	17.09.98	DR	3	22.0	33.4	4.9	Sand
5	17.09.98	DR	4	22.0	33.4	4.7	Sand
6	28.07.97	SN	0.5	24.8	28.7	5.0	Rock
7	17.09.98	DR	4	22.0	33.4	4.7	Sand
8	17.09.98	DR	35	22.0	33.5	4.2	Mud
9	17.09.98	DR	3	22.0	33.4	5.2	Sand
10	17.09.98	DR	3	22.0	33.4	4.9	Sand
11	26.07.97	SN	0.5	25.4	27.2	5.4	Rock
12	27.07.97	SN	0.5	24.0	27.7	5.3	Rock
13	18.09.98	DR	70	16.5	38.0	5.6	Mud
14	18.09.98	DR	30	19.2	36.9	4.2	Sand
15	18.09.98	DR	30	19.4	36.8	4.2	Sand
16	18.09.98	DR	25	21.0	34.1	4.9	Sand
17	18.09.98	DR	9	22.0	33.4	5.9	Rock
18	16.09.98	DR	13	23.0	34.4	6.8	Sand
19	16.09.98	DR	15	22.8	34.2	6.9	Sand
20	27.07.97	SN	0.5	25.2	27.0	5.2	Rock
21	11.06.98	SN	0.5	24.3	29.9	8.4	Rock

Özet

Bu çalışmada, dip materyali 1997-1998 tarihleri arasında, Gökçeada'da 0-70 m derinlikler arasındaki 21 istasyondan dreç, fanyalı ağ ve el kepçesi ile toplandı. 4 familyaya ait 14 Anomura türünün ekolojik özellikleri saptandı ve bu türlerden 1 tür [*Pagurus excavatus* (Herbst, 1971)] Türkiye denizleri için yeni olarak kaydedildi.

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